



"I KNOW IT'S NOT TOO GOOD, BUT IF WE JUST DUMP IT, WE'LL BE VIOLATING THE HAZARDOUS WASTES ACT."



"WHAT'S THE DIFFERENCE? IT WAS A MAN-MADE LAKE IN THE FIRST PLACE."

2014 Hazardous Waste Training

Hazardous Waste Inspections

July 8 -10, 2013 EPA Hazardous Waste and Clean Water Act

- July 17, 2013 Mailed a corrective action plan to EPA
- January 14, 2014 Received a request for more information
- February 12, 2014 Mailed the response to EPA

June 3-5, 2014 GSFC Hazardous Waste Audit

June 2014 GSFC Hazardous Materials and Hazardous Waste
Quality Audit

FY 2014 EPA Hazardous Waste Inspection

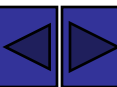
September 8-12, 2014, NASA Headquarters Environmental
Functional Review (EFR)

Top EPA Findings

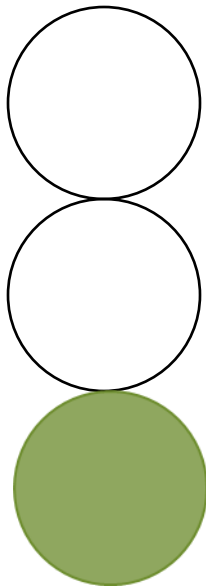
Top EPA findings - lightbulbs in corners, not in closed boxes, universal waste labels not dated, open HW containers, old chemicals



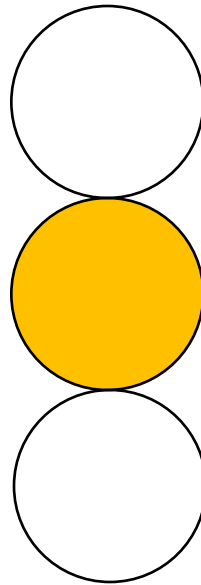
UNIVERSAL WASTE	
SHIPPER	
ADDRESS	
CITY, STATE, ZIP	Batteries
CONTENTS	
ACCUMULATION START DATE	3/1/2013



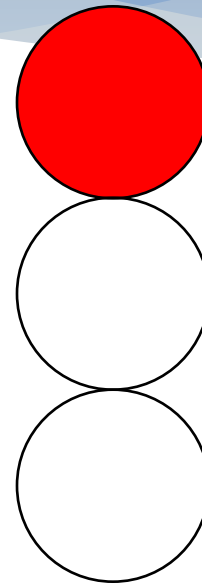
Recent WFF EPA HW Inspections



2007



2010



2013

EPA Inspection Observations

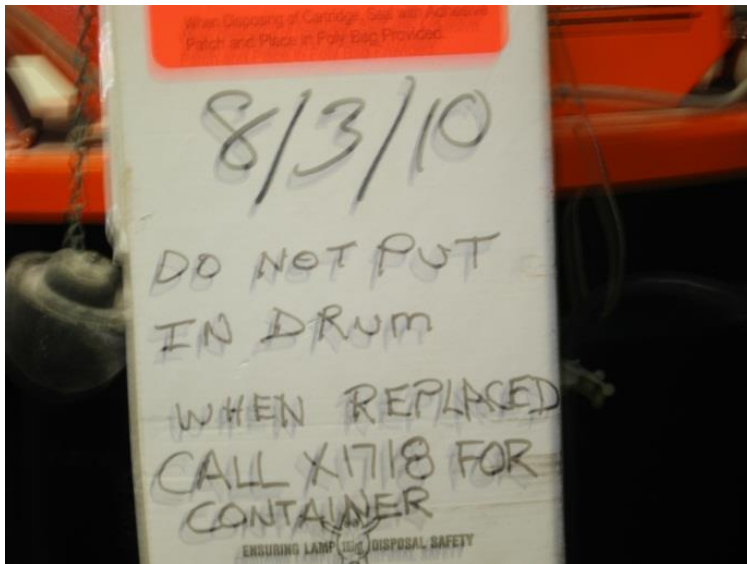
- Potential to Mix Solvent and Oily Rags and Potential to Improperly Dispose of Solvent Rags. Waste generators have been interviewed and new containers provided. In most cases, all rags and techwipes can be put in the same container.



- An open box of light tubes were found. The bulbs appeared to be new, but were crushed before a determination was made. Expired bulbs must always be kept in a closed box labeled “Universal Waste Bulbs” and dated.

EPA Inspection Observations

- Potential to improperly dispose of filter. To avoid confusion regarding the disposal of the filter on the fluorescent tube crusher, a note has been placed on the current crusher filter and the new stock filter to not place the filter in the drum and to call the Environmental Office Hazardous Waste Hotline for a disposal container.



EPA Inspection Observations

- Solder waste cans were not properly labeled and closed.

Each solder waste can has a Hazardous Waste (HW) label and instructions to call the Hazardous Waste Hotline at extension 1718 to empty the container. HW generators should only deposit solder waste in the labeled HW containers and not transfer the solder waste to any other container. Each solder can is considered a separate SAA and included on the SAA list.



EPA Inspection Observations

- Acid bath process neutralized and poured down the sink.

Process investigated and found to be compliant with Virginia Pollutant Discharge Elimination System (VPDES) permit. All process discharges must be approved by the Environmental Office.



EPA Inspection Observations

- SAA containers not near the point of generation. Containers were moved to be closer to the process.
- Open HW container. Container was closed.
- Hazardous Waste was found on the ground outside the container. Bead blasting and sand blasting grit was swept up and placed in the container.



EPA Inspection Observations

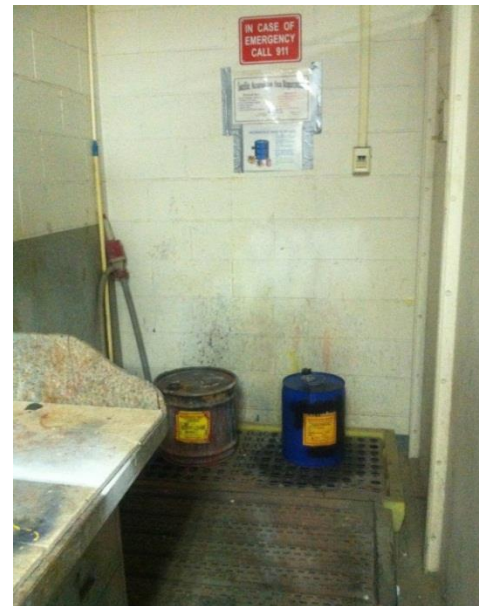
- Scrap metal turnings found on the floor and therefore, not treated as a valuable commodity. Scrap metal should be swept up and placed in bins for recycling at the end of the process. All containers should be labeled scrap metal or metal for recycling.



EPA Inspection Observations

- Potential to accumulate more than 55 gallons of hazardous waste at a satellite area. Container sizes were reduced so that even when full the maximum amount of hazardous waste in an area would not exceed 55 gallons.

During Inspection



After Inspection

EPA Inspection Observations

- Sandblasting grit was disposed of by dumping on the ground behind a building.

The sandblasting grit still in-use inside the machine was analyzed and found to contain cadmium at a level which makes it a hazardous waste. The area where the material was dumped was also sampled.

No waste, including trash can be left on the ground. Each type of waste must be disposed of by placing it in the proper container.



EPA Inspection Observations

- It was incorrectly communicated that both diesel and gasoline fuel filters were crushed and drained, with the gasoline/diesel mixture poured into the used oil container.

Gasoline filters were not crushed, nor was gasoline poured in the used oil. Used oil is analyzed frequently to ensure that the waste stream is properly characterized. Gasoline filters are placed in a hazardous waste container. Diesel and oil filters are recycled.



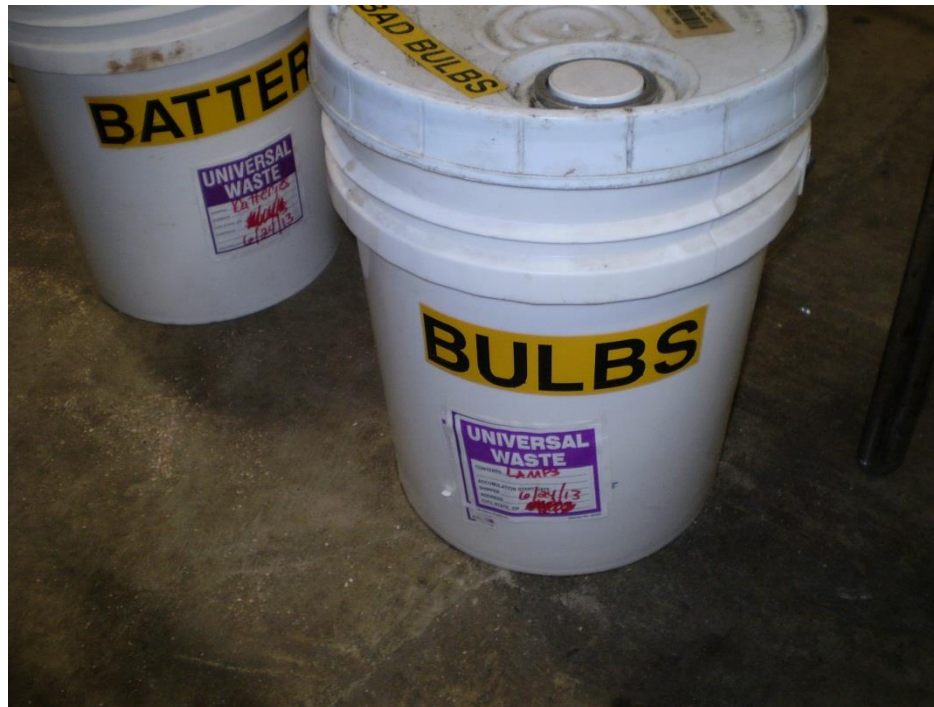
EPA Inspection Observations

- Many answers were given regarding the disposal of aerosol spray cans. These answers included puncturing with a pen knife, throwing them in the trash and calling the Environmental office for pickup. Aerosol cans should not be punctured in the field. Each work area that has aerosol cans should have a container for collecting used aerosol cans. All aerosol cans should be turned in to the Environmental Office when they are no longer needed.



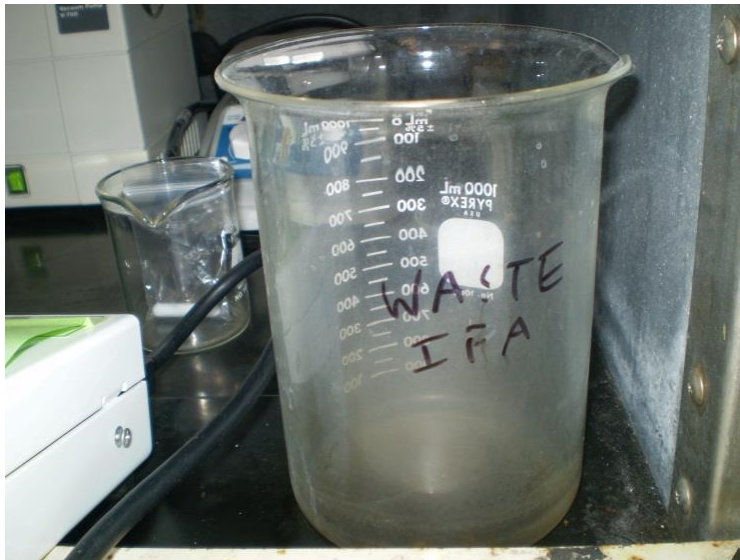
EPA Inspection Observations

- A universal waste container had a scratched-out date and a current date. The label was replaced with a fresh label



EPA Inspection Observations

- An empty laboratory container was labeled as “Waste IPA” while another unlabeled container held a dirty fluid. The container was relabeled “In-use IPA” to reflect the continued use of Isopropyl Alcohol (IPA) which is no longer virgin and the type of material in the container.



During Inspection



After Inspection

EPA Inspection Observations

- An empty un-labeled tank was described as having recently held a low pH mixture. In the same area chemical process filters were disposed of in the trash. The tank was marked as not in use and the work area was provided hazardous waste containers to hold waste filters.



DOs and DON'Ts of Audit Conduct

1. **Positive Approach** – Do have a positive and cooperative attitude.
2. **Speed** – Do quickly respond when called upon for help.
3. **Interpretation** – Do make sure you understand the question.
4. **Honesty** – Don't provide inaccurate data. Don't guess. If you don't know the answer say so.
5. **Diplomacy** – Don't argue with the interviewer.
6. **Objectivity** – Don't be on the defensive or apologetic, don't complain or be negative.
7. **Tact** – Don't be critical of your organization or management.
8. **Communication** – Don't discuss work outside your area.
9. **Consideration** – Do consider to the position of the auditor.
10. **Simplicity** – Do answer only the question asked.



Dos and DON'Ts of Audit Conduct

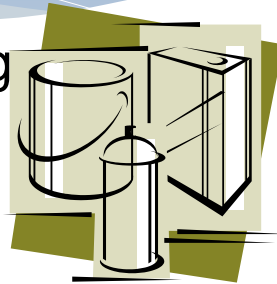
11. **Ownership** – Don't blame your performance or problems on others.
12. **Preparedness** – Do anticipate questions concerning problem areas and have the answers ready.
13. **Accuracy** – Do let the escort know if you have provided information to the auditor inadvertently.
14. **Confidentiality** – Do show only normal business files and records.
15. **Sensitivity** – Don't release inappropriate information.
16. **Self-Confidence** – Don't be concerned if you must contact someone for help with the audit or authority to release data.
17. **Teamwork** – Do inform your manager of the details of the interview immediately after.
18. **Documentation** – Do be aware that documents and procedures are available and their location.
19. **Integrity** – Do nothing that would compromise GSFC.
20. **Closure** – Do fix any simple problems immediately. Assure the root cause is identified and eliminated.



Typical Audit Questions

How do you use this chemical?

(Auditors are looking to see if you wipe the chemical on a rag techwipe and what you do with the techwipe.)



When was the last time you used this chemical?

(Auditors are looking to see if this chemical should be considered a waste.)



Where do you put this shop towel when you are finished with it?
(Auditors are looking to make sure you put it in the HW container.)

What do you do with your fluorescent bulbs?

(Auditors are looking to make sure that you don't store them unlabeled in an open box somewhere)



Typical Audit Questions

How do you know what you put on the HW label?

(Auditors are looking to see if you understand the HW portion of your job.)

What do you do with your waste solder sponges?

(Auditors will be looking to see that you put them in the HW container and do not transfer them to another container.)

Describe what you do?

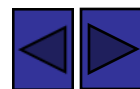
(Auditors are looking for a waste generation processes.)

Be prepared for auditors to ask you the same question several times or restate your answer

Chemical Storage Lockers



- ❖ Outside sign correct.
- ❖ No compressed gases.
- ❖ No expired chemicals or damaged aerosol cans.
- ❖ No rags or excess paper.
- ❖ All chemicals labeled.
- ❖ All lids secure.
- ❖ All chemicals upright.
- ❖ All compatible chemicals.
- ❖ Three point closing.



Labeling Chemicals

- ❖ Name of Chemical..
- ❖ Warning Words (Flammable, Corrosive, etc).
- ❖ If expiration dates are used, they must be current.



RCRA

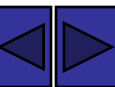
In 1976, Congress passed the Resource Conservation and Recovery Act or RCRA. This directed the Environmental Protection Agency (EPA) to develop and implement a program to protect human health and our environment from improper handling of hazardous waste and unsafe management practices.



Solid Waste

Any solid, liquid, or contained gaseous material that is no longer used, and is either recycled, thrown away, or stored until sufficient quantities are accumulated for treatment or disposal.

Hazardous wastes are currently regulated by both Federal and state environmental laws.



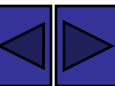
Hazardous Waste

A waste is classified as “Hazardous” in one of two ways:

- ❖ It is specifically listed as hazardous waste in EPA regulations (e.g. F-List, P-List, etc).

OR

- ❖ It exhibits any of the characteristics specified by EPA regulations as hazardous. (ignitable, corrosive, reactive, or toxic).



Characteristic Hazardous Waste

D001 Ignitable (flashpoint < 140F)

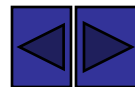
D002 Corrosive ($\text{pH} \geq 12.5$, $\text{pH} \leq 2$)

D003 Reactive (unstable, reacts violently with water, explosive)

D004 Arsenic

D005 Barium

D006 Cadmium (nickel cadmium batteries)



Characteristic Hazardous Waste

D007 Chromium (zinc chromate spray paint)

D008 Lead (tin lead solder scraps)

D009 Mercury (broken thermometers)

D011 Silver (x-rays)

D018 Benzene (gasoline fuel filters)

D035 Methyl ethyl ketone (paint thinner)

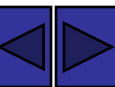
D039 Tetrachloroethylene



Listed Hazardous Waste

Example -Hazardous waste from non-specific sources

F003 The following spent non-halogenated solvents:
xylene, acetone, ethyl acetate, ethyl benzene,
ethyl ether, methyl isobutyl ketone, n-butyl
alcohol, cyclohexanone, and methanol;
all spent solvents mixtures/blends containing,
before use, only the above spent non-
halogenated solvents;
and all spent solvent mixtures/blends containing,
before use, one or more of the above non-
halogenated solvents, and a total of ten percent
of F001, F002, F004, and F005.



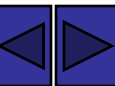
Listed Hazardous Waste

Acute

- P001 – Warfarin (rat poison)
- P015 – Beryllium
- P042 - Epinephrine

Commercial Chemical Products

- U165 - Naptha
- U220 – Toluene
- U080 – Methylene Chloride

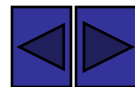


Identify Hazardous Waste

- ❖ Identification
- ❖ Hazardous Ingredients and Components
- ❖ Physical & Chemical Characteristics
- ❖ Fire & Explosion Hazards
- ❖ Reactivity Data
- ❖ Health Hazard Data
- ❖ Spill/Leak Procedures
- ❖ Special Protection
- ❖ Special Precautions



<http://msdspro.gsfc.nasa.gov/>



Is this a Hazardous Waste?

SHERWIN-WILLIAMS CO -- G2 AEROSOL SPRAY LINE-2 (PAINTS), G2A156 DARK GRAY -- 8010-00No70920

===== Fire Fighting Measures

Flash Point:<21F,<-6C

Lower Limits:0.5%

Upper Limits:12.0% Extinguishing

Media:USE CARBON DIOXIDE, DRY CHEMICAL, FOAM.

Fire Fighting Procedures:WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP .

WATER SPRAY MAY BE INEFFECTIVE. IF WATER IS USED, FOG NOZZ ARE PREF. WATER MAY BE USED TO COOL (SUP DAT)

Unusual Fire/Explosion Hazard:KEEP CONTRS TIGHTLY CLSD. ISOLATE FROM HEAT, ELEC EQUIP, SPARKS & OPEN FLAME. CLSD CONTRS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. APPLICATION TO HOT (SUP DAT)



Label Hazardous Waste

HW labels
must:



- ❖ Identify or Name the Chemical,
- ❖ Include the words: “Hazardous Waste,” and
- ❖ Not dated unless 55G or 1 qt acute hazardous waste.

Label Regulated Waste



Petroleum products

- ❖ Label with the words “Used Oil.”



Universal waste

(fluorescent lamps, thermostats, batteries)

- ❖ Label with the words “Universal waste lamps, batteries, etc.” and start date.



Other nonhazardous waste

- ❖ Label with container contents.



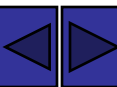
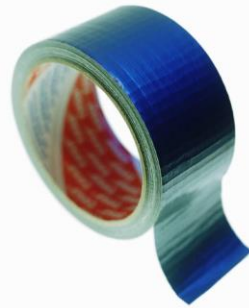
Universal Waste Reminder Signs

UNIVERSAL WASTE	
SHIPPER	_____
ADDRESS	_____
CITY, STATE, ZIP	_____
CONTENTS	Batteries
ACCUMULATION START DATE	3/1/2013

- ✓ Date the label when the first battery is added to the container.
- ✓ **Check the date.**
- ✓ Call 1718 if the date is 9 months old.
- ✓ Keep the container closed.

Universal Waste Batteries

Please TAPE
contact ends of
Lead acid, Nickel
Cadmium, Nickel Metal
Hydride, Lithium,
Silver, Mercury, etc.)



SAA



The Satellite Accumulation Area (SAA) is:

- ❖ Designated HW storage point (Environmental Office),
- ❖ Near the point-of-generation (work area),
- ❖ A centralized storage area for one or many points-of-generation,
- ❖ Capable of being locked,
- ❖ In compliance with regulatory requirements, and
- ❖ Managed by a designated point-of-contact who is responsible for upholding and enforcing all requirements.

SAA Requirements

- ❖ Spill kit
- ❖ Emergency Communication
- ❖ Secondary Containment (liquids)
- ❖ Storage aids
- ❖ Sign with contact numbers
- ❖ Inspection sheet
- ❖ SDS



Store Hazardous Waste

Containers must be :



- ❖ In good condition (no holes, dents),
- ❖ Within secondary containment (liquids),
- ❖ Compatible,
- ❖ Closed wrench tight, Upright,
- ❖ Sturdy, and with
- ❖ 3-5 inches of headspace.

Hazardous Waste Quantity

Maximum Quantity

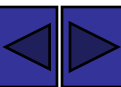
55

55

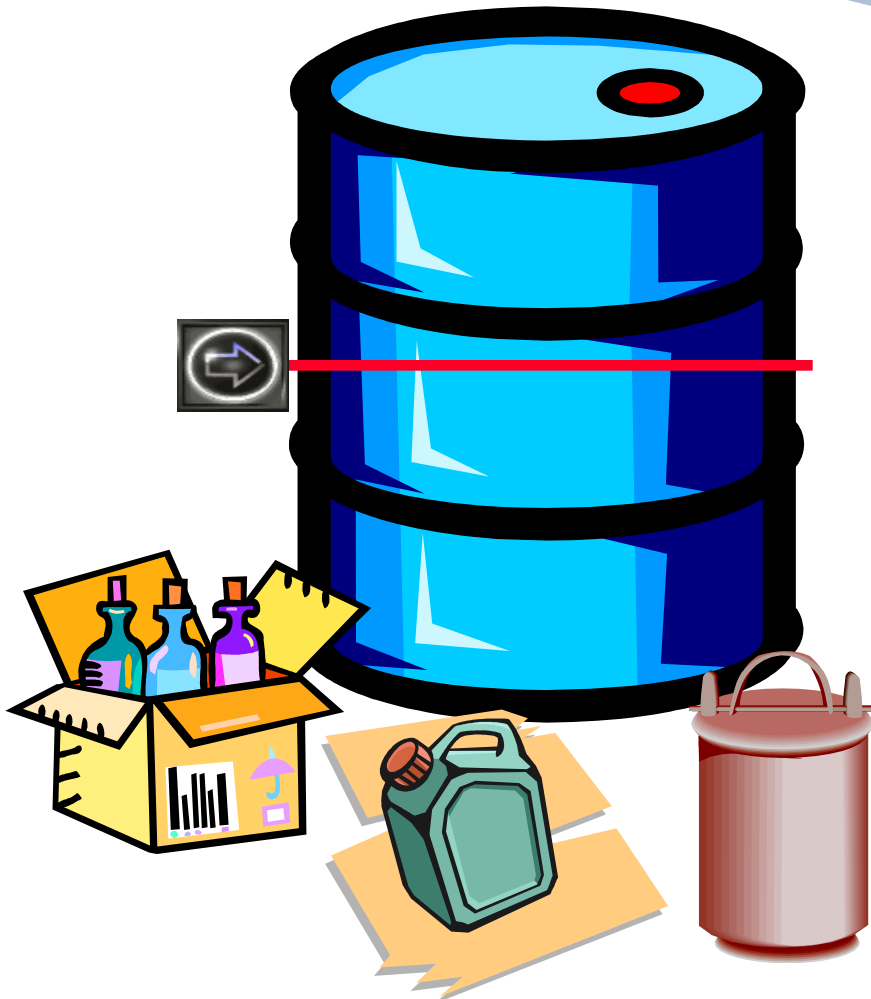
55

❖ 55 Gallons of HW or 1 Quart of Acute HW (P-list example P042 epinephrine).

- ❖ 55 gallon limit includes:
 - ❖ All points of generation within the SAA.
 - ❖ All types of HW in the SAA.

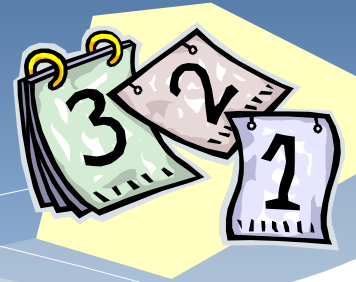


Hazardous Waste Reminder Signs



- ✓ Add gallons in each waste container together.
- ✓ Total waste in all containers must be less than 55G.
- ✓ Check the line on the drum.
- ✓ When waste reaches the line on the drum, total waste in SAA may equal 55G.
- ✓ Call 1718 when waste reaches line on drum or before waste exceeds 55G.

Time Limits



❖ 3 days for 55 total gallons of Hazardous Waste.

❖ 1 year from date first Universal Waste item placed in the container.



❖ No time limit for nonhazardous waste, but full containers should be removed.

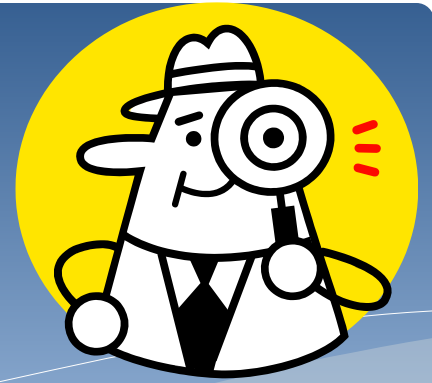


Control Hazardous Waste



- ❖ SAA is to be under the control of the operator of the process.
- ❖ POC is responsible for SAA.
- ❖ The SAA must be inspected at least monthly if it contains Hazardous Waste.

Inspecting the SAA



- ❖ All containers closed.
- ❖ Containers not leaking or bulging.
- ❖ All containers labeled.
- ❖ Less than 55 gallons hazardous waste.
- ❖ SAA sign and inspection sheet updated.
- ❖ Liquids stored on secondary containment.
- ❖ All people trained.
- ❖ Good Housekeeping.

Turn-In Procedures

- ❖ Fill out Hazardous Waste Disposal Inventory Form (GSFC 23-54).
- ❖ Call the HW Line at 1718.
- ❖ While awaiting pickup, keep chemicals:
 - Segregated,
 - Packaged to avoid breakage,
 - Liquids on secondary containment,
 - Labeled, and
 - Do not date the label unless 55G.



Hazardous Waste Disposal Inventory Form

Hazardous Waste Disposal Inventory/Greenbelt/Wallops



Generator Information										
Name:						Date:		Phone:		
Code:				Building:			Room:			
Waste Inventory										
Item	WASTE DESCRIPTION <i>Describe material to be collected by its specific chemical constituents or by trade name.</i>	WASTE ID OR CONTAINER # <i>(Provided by the Environmental Office).</i>	GENERATING PROCESS <i>Describe the work process that made the waste, e.g., expired shelf life, cleaning paint brushes.</i>	CONTAINERS			STATE			WASTE TRAIT
				No.	Size	Type	Gas	Liquid	Solid	Trait
1.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CA - Corrosive Acid (pH<2) CB - Corrosive Base (pH>12.5) F - Flammable (Flashpoint <140F) NR - Non-Regulated Ox - Oxidizer Px - Peroxide R - Reactive (H ₂ O, air or otherwise sensitive) T - Toxic Other (Specify)
2.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10.							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Generator Comments										
Have you received Resource Conservation and Recovery Act (RCRA) generator training within the last 12 months?							Yes <input type="checkbox"/>		No <input type="checkbox"/>	
Have you made a good faith effort to minimize your waste generation by considering substitutes or alternatives?							Yes <input type="checkbox"/>		No <input type="checkbox"/>	
Comments - Indicate special requirements (if any) for collection of the waste material, e.g., restricted access to an area, appointment needed, generator wishes to monitor collection, etc:										
Generator Certification										
<input type="checkbox"/> I hereby declare that the contents of this inventory are fully and accurately stated as described by their waste, process, and container parameters.										
Printed Name:				Signature:				Date:		
Date Received:				Date Collected:				Initials:		

At Greenbelt, when ready for pickup, you may e-mail the completed form to gsfc-hazwaste@lists.nasa.gov, or fax it to 6-0368. Coordinate waste pickup by dialing 6-9233.
 At Wallops, when ready for pickup, fax completed form to x1819. Coordinate waste pickup by dialing x1718.

GSFC Form 23-54 (February 2012) Previous editions are obsolete.

Page 1 of 1



HW Flow



Only HW in process of being generated shall be at the point of generation.

At the end of the shift or when a process is complete, waste containers should be returned to the SAA.

Chemicals which have been declared a waste should be kept in the SAA.

Empty Containers

Hazardous waste containers or liners are empty when:

- all wastes have been removed which can be removed, and
- no more than 1 inch of residue remains on the bottom, or
- no more than 3% by weight of total capacity remains (containers <110 gal).



Aerosol Cans

New Policy - Aerosol Can Disposal

The Environmental Office will now be COLLECTING ALL AEROSOL CANS. No aerosol cans should be placed in the trash, even if they are empty.

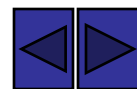
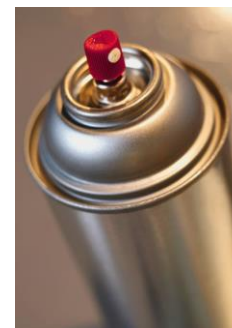
This is a change from what was discussed in the annual Hazardous Waste training you attended in April and May 2013.

If you need a container to collect empty and discarded aerosol cans, please call the Hazardous Waste Hotline at x1718.

If you infrequently empty a can, just call 1718, and we will pick up that can.



If you have questions, please call Marianne Simko at x2127 or Shane Whealton at x1090.

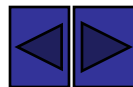


Not for the dumpster....



Some unacceptable wastes:

- ❖ Hazardous waste (includes contaminated rags);
- ❖ Asbestos, and medical waste;
- ❖ Non food liquid;
- ❖ Closed drums;
- ❖ Improperly prepared containers such as paint cans and pesticide containers;
- ❖ Unapproved industrial process waste or sewage sludge;
- ❖ Damaged spray cans.

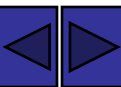


Recycling at WFF

The following items are recycled at WFF as part of the single stream program:

- ❖ Cardboard, newspapers, magazines, paperboard
- ❖ White and colored paper,
- ❖ Aluminum and bi-metal cans, and
- ❖ #1 and #2 plastic bottles and glass bottles

Toner cartridges are also recycled by calling the Help Desk



Waste Prevention Tips

- ❖ Reduce, Reuse, Recycle.
- ❖ Pursue environmentally friendly alternatives.
- ❖ Perform regular maintenance and housekeeping.
- ❖ Order what you need - avoid surplus inventory.
 - ❖ Turn-in unexpired chemicals for reuse.
- ❖ Purchase recycled products.



Phase Out These Chemicals

- Benzene
- Cadmium
- Carbon Tetrachloride
- Chloroform
- Chromium
- Cyanide
- Dichloromethane
- Lead
- Mercury
- MEK
- MIBK
- Nickel
- Tetrachloroethylene
- Toluene
- 1,1,1 Trichloroethane
- Trichloroethylene
- Xylene
- Methylene Chloride

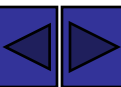


Request Recycled Content Items

Federal agencies or their contractors that buy any of the EPA designated products, must buy them with recycled content.

A complete list of designated products, recovered material content levels, and vendors can be found at

www.epa.gov/cpg/



Use BioPreferred Products

USDA Designated Products as part of the Farm
2002 <http://www.biopreferred.gov/Default.aspx>



- Mobile equipment hydraulic fluids
- Urethane roof coatings
- Water tank coatings
- Diesel fuel additives
- Penetrating lubricants
- Bedding, bed linens, and towels

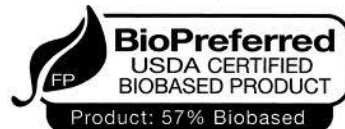
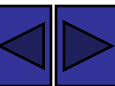


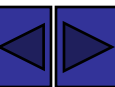
Figure 1. Label, with Biobased Product Statement, for a Product that is Within a Designated Item.



Waivers

Any time a product must be purchased and it is not available with recovered or biobased content, a waiver must be signed by the Environmental Office.

Contact Joel Mitchell x1127

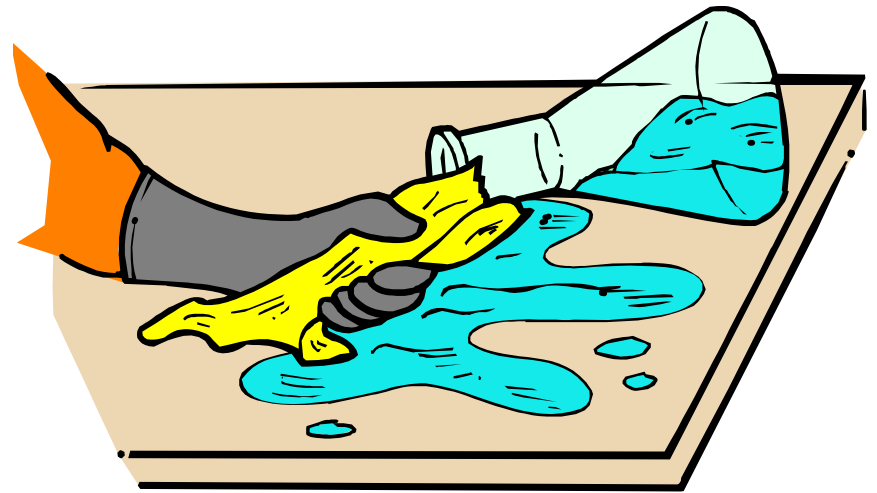


Spill Procedures

WFF has established procedures to ensure protection of human health and the environment.

❖ WFF's Integrated Contingency Plan (ICP)

❖ WFF ICP Training



Emergency Procedures

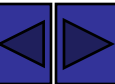


Emergency Number: 911

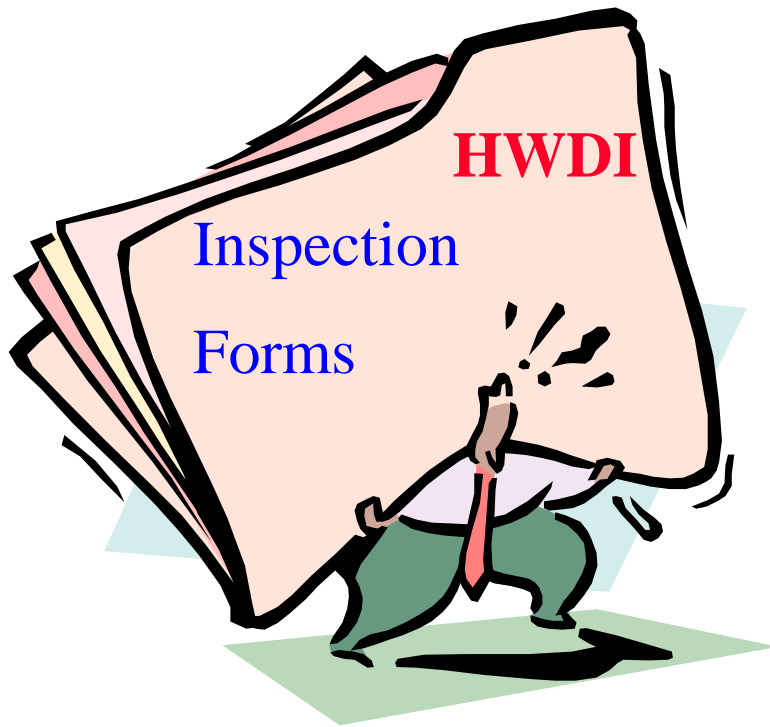
- Name and code of reporting party,
- Type/name of material spilled,
- Location of spill,
- Cause of spill,
- Estimated quantity and flow rate of spill,
- Time of spill.

Hurricane Procedures

- WE WILL CHECK/CALL ALL SAA.
- WE WILL PICK UP HW.
- DO NOT BRING HW TO US.
- DO NOT DROP OFF HW OUTSIDE OF N-223, U-81, or B-29.
- DO NOT LEAVE A CONTAINER UNLABELED.



HW Forms



- ❖ Environmental Office (x1718)
- ❖ GDMS (Forms 23-54 and 23-63)
<http://gdms.gsfc.nasa.gov/gdmsnew/home.jsp>
- ❖ Code 250 website
<http://sites.wff.nasa.gov/code250/forms.html>

Follow-up



- Inspect SAA container integrity *monthly*.
- Think about areas where processes or chemicals can be changed to reduce waste.
- Call the Environmental Office to dispose of items which are no longer used or have expired (x1718).